

**Claims**

1. A water disposal system for disposing water generated during power generation by a power generator, characterized  
5 by comprising:

a water-absorbing member provided to said power generator as being extended from said power generator, for recovering and moving said water by utilizing capillary phenomenon; and

10 a water-retaining member for temporarily accumulating said water.

2. The water disposal system according to claim 1, characterized in that

15 said power generator is a fuel cell comprising:

an anode supplied with a substance mainly composed of hydrogen as an active material;

a cathode exposed to the open air and supplied with oxygen hydrogen as an active material; and

20 an electrolyte film as being held between said anode and cathode.

3. The water disposal system according to claim 2, characterized in that:

25 said cathode has a current collector formed thereon, an opening through which oxygen is supplied to said cathode is formed in said current collector, and

a water-absorbing member formed on the circumference of said opening.

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4. The water disposal system according to claim 3,

characterized in that:

said water-absorbing member is formed to surround the circumferential portion of said opening so as to cover said opening and to reach said cathode.

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5. The water disposal system according to claim 1, characterized in that:

said water-absorbing member is composed of a string-formed material having a void portion formed therein  
10 in the longitudinal direction thereof, or a porous material having recessed portions on the surface thereof.

6. The water disposal system according to claim 1, characterized in that:

15 said water-absorbing member is provided on the surface of an electronic device to which said power generator is mounted, as being extended therefrom.

7. The water disposal system according to claim 1,  
20 characterized in that:

said water-absorbing member has an irregular-shaped portion or a projected portion.

8. The water disposal system according to claim 6,  
25 characterized in that:

said water-retaining member is provided between said water-absorbing member and said electronic device.

9. The water disposal system according to claim 1,  
30 characterized by comprising:

a water-absorbing layer having at least water

absorbency, air permeability and electro-conductivity, provided between a diffusion layer and a current collector.

10. A method of disposing water generated during power  
5 generation by a power generator, characterized by comprising the steps of:

recovering and moving said water by utilizing capillary  
phenomenon, to dispose said water to the external of said  
power generator, or to dispose said water to the external of  
10 said power generator after temporary accumulation.

11. The method of disposing water according to claim 10,  
characterized in that:

said water existed in a diffusion layer is absorbed by  
15 a water-absorbing layer having at least water absorbency, air permeability and electro-conductivity, provided between a diffusion layer and a current collector, and said water absorbed by said water-absorbing layer is further absorbed by a water-absorbing member partially brought into contact  
20 with said water-absorbing layer.

12. A power generation apparatus for generating electric  
power by supplying a fuel gas and an oxidizer gas, and by  
allowing said fuel gas and said oxidizer gas to  
25 electrochemically react with each other to generate electric power, characterized by comprising:

a water-absorbing member provided to said power  
generator as being extended from said power generator, for  
recovering and moving said water by utilizing capillary  
30 phenomenon.

13. The power generation apparatus according to claim 12, characterized by comprising:

a water-retaining member for temporarily accumulating said water.

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14. The power generation apparatus according to claim 12, characterized by comprising:

a water-absorbing layer having at least water absorbency, air permeability and electro-conductivity,  
10 provided between a diffusion layer and a current collector.

15. A water disposal system for disposing water generated during power generation by a power generator, characterized by comprising:

15 a separator having, formed thereon, a fuel supply groove for supplying a fuel gas to a first electrode and an oxidizer supply groove for supplying an oxidizer to a second electrode, and for holding said power generator; and

water disposal means for disposing said water, provided  
20 at least on the midway portion of said oxidizer supply groove.

16. The water disposal system according to claim 15, characterized in that:

said water disposal means is a water-absorbing member  
25 for absorbing said water.

17. The water disposal system according to claim 16, characterized in that:

said water disposal means is provided along at least a  
30 partial region of a sidewall of said oxidizer supply groove.

18. The water disposal system according to claim 17, characterized in that:

said water-absorbing member is provided so as to cover at least a part of the surface having said oxidizer supply groove formed therein.

19. The water disposal system according to claim 18, characterized in that:

said separator has a heat sink portion formed thereon for dissipating heat of said power generator; and

said water-absorbing member provided so as to cover at least a part of the surface having said oxidizer supply groove formed therein is formed so as to be a predetermined shape extended from the surface having said heat sink portion formed therein, and so that the region of said predetermined shape covers at least a part of said oxidizer supply groove.

20. The water disposal system according to claim 16, characterized in that:

said water-absorbing member is a member absorbing said water by utilizing capillary phenomenon.

21. The water disposal system according to claim 20, characterized in that:

said water-absorbing member is an aggregate of string-formed fiber having a void portion formed therein in the longitudinal direction.

22. The water disposal system according to claim 20, characterized in that:

said water-absorbing member comprises a three-layered

structure in which a two-layered structure including a first material having a water-absorbing/releasing property and a second material having a water absorbency bonded with each other is bonded with a predetermined tape material on the  
5 lower side of said second material.

23. The water disposal system according to claim 22, characterized in that:

said second material is a material absorbing said water  
10 by utilizing capillary phenomenon.

24. The water disposal system according to claim 15, characterized in that:

as said water disposal means, said oxidizer supply  
15 groove having a roughened surface is used.

25. The water disposal system according to claim 15, characterized in that:

as said water disposal means, said oxidizer supply  
20 groove having a high water-repellent region formed therein is used.

26. The water disposal system according to claim 15, characterized in that:

25 as said water disposal means, said oxidizer supply groove having a high hydrophilic region formed therein is used.

27. The water disposal system according to claim 15,  
30 characterized in that:

said fuel gas is a hydrogen gas; and

said oxidizer gas is air including oxygen.

28. The water disposal system according to claim 15, characterized in that:

5        said power generator has a predetermined electrolyte film provided between said first electrode and said second electrode.

29. The water disposal system according to claim 15,  
10 characterized by comprising:

        a water-absorbing layer having at least water absorbency, air permeability and electro-conductivity, provided between a diffusion layer and said separator.

15 30. A method of disposing water generated during power generation by a power generator, characterized by comprising:

        a power generation step in which a fuel gas is supplied to a first electrode through a fuel supply groove formed on a separator which holds said power generator, while an  
20 oxidizer gas is supplied to a second electrode through an oxidizer supply groove formed on said separator, to allow said power generator to generate electric power; and

        a water disposal step for disposing said water using water disposal means provided on the midway region of said  
25 oxidizer supply groove.

31. The method of disposing water according to claim 30, characterized in that:

        in said water disposal step, said water existed in said  
30 diffusion layer is absorbed by a water-absorbing layer having at least water absorbency, air permeability and

electro-conductivity, provided between said diffusion layer and said separator; and said water absorbed by said water-absorbing layer is further absorbed by a water-absorbing member partially brought into contact with  
5 said water-absorbing layer.

32. A power generation apparatus for generating electric power by supplying a fuel gas and an oxidizer gas, and by allowing said fuel gas and said oxidizer gas to  
10 electrochemically react with each other, characterized by comprising:

a power generator having a predetermined electrolyte film provided between a first electrode and a second electrode;

15 a separator having, formed thereon, a fuel supply groove for supplying said fuel gas to said first electrode and an oxidizer supply groove for supplying said oxidizer gas to said second electrode, and for holding said power generator; and

20 water disposal means for disposing water generated during power generation by said power generator, provided at least on the midway portion of said oxidizer supply groove.

33. The power generation apparatus according to claim 32, characterized in that:

25 said water disposal means is a water-absorbing member for absorbing said water.

34. The power generation apparatus according to claim 33, characterized in that:

30 said water-absorbing member is provided along at least a partial region of a sidewall of said oxidizer supply groove.



35. The power generation apparatus according to claim 34, characterized in that:

5 said water-absorbing member is provided so as to cover at least a part of the surface having said oxidizer supply groove formed therein.

36. The power generation apparatus according to claim 35, characterized in that:

10 said separator has a heat sink portion formed thereon for dissipating heat of said power generator; and

15 said water-absorbing member provided so as to cover at least a part of the surface having said oxidizer supply groove formed therein is formed so as to be a predetermined shape extended from the surface having said heat sink portion formed therein, and so that the region having said predetermined shape covers at least a part of said oxidizer supply groove.

37. The power generation apparatus according to claim 33, characterized in that:

20 said water-absorbing member is a member absorbing said water by utilizing capillary phenomenon.

38. The power generation apparatus according to claim 37, characterized in that:

25 said water-absorbing member is an aggregate of string-formed fiber having a void portion formed therein in the longitudinal direction.

30 39. The power generation apparatus according to claim 37, characterized in that:

said water-absorbing member comprises a three-layered structure in which a two-layered structure including a first material having a water-absorbing/releasing property and a second material having a water absorbency bonded with each other is further bonded with a predetermined tape material on the lower side of said second material.

40. The power generation apparatus according to claim 39, characterized in that:

10        said second material is a material absorbing said water by utilizing capillary phenomenon.

41. The power generation apparatus according to claim 32, characterized in that:

15        as said water disposal means, said oxidizer supply groove having a roughened surface is used.

42. The power generation apparatus according to claim 32, characterized in that:

20        as said water disposal means, said oxidizer supply groove having a high water-repellent region formed therein is used.

43. The power generation apparatus according to claim 32, characterized in that:

25        as said water disposal means, said oxidizer supply groove having a high hydrophilic region formed therein is used.

30 44. The power generation apparatus according to claim 32, characterized in that:

said fuel gas is a hydrogen gas; and  
said oxidizer gas is air including oxygen.

45. The power generation apparatus according to claim 32,  
5 characterized by comprising:

a power generation section having a stacked structure  
in which a plurality elements holding said power generator  
by said separator is stacked.

10 46. The power generation apparatus according to claim 32,  
characterized by comprising:

a water-absorbing layer having at least water  
absorbency, air permeability and electro-conductivity,  
provided between a diffusion layer and said separator.

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